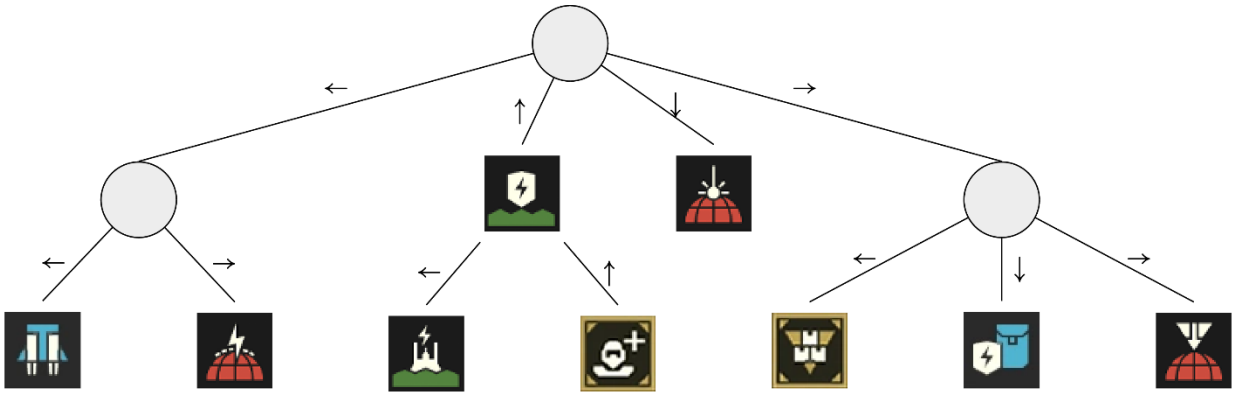
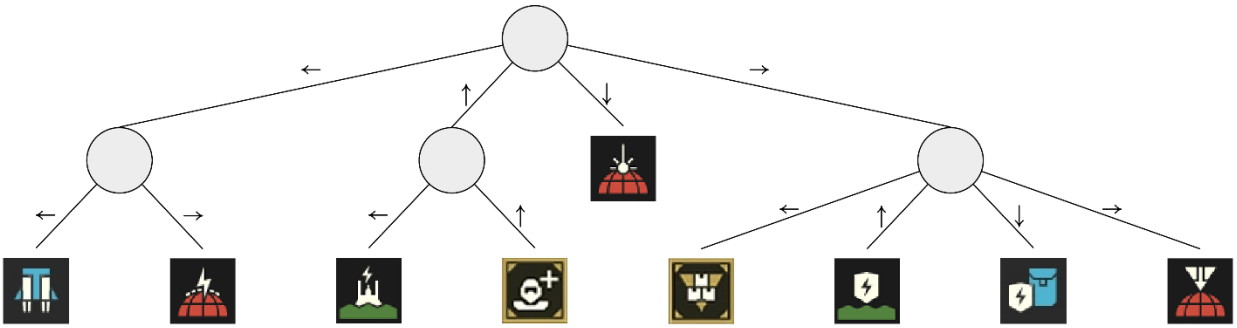
6. Jared

Program Name: Jared.java **Input File: jared.dat**

Jared recently discovered a new up-and-coming game with a key mechanic known as "Stratagems." These Stratagems allow the player to input a unique code using the left, up, down, and right arrow keys, which allows them to trigger a special ability. However, through his own playing of the game, he found himself oftentimes struggling to input the codes for these various Stratagems in the heat of the moment. However, after looking into why he was struggling so much, he discovered a fatal flaw with the input codes for the Stratagems: some of the codes are prefixes of other codes!



The tree above represents the current state of Jared's Stratagem inputs. Note that the input "↑" is a prefix for the input "↑←" and "↑↑".



The tree above represents Jared's modified set of inputs where no Stratagem input is the prefix of any other Stratagem input.

Before Jared decides to convince his friends to buy the game and play it with him, he wants to make sure that no two Stratagem input codes are prefixes of one another. Help Jared write a program that, given a set of Stratagem input codes, determines if no Stratagem input code is the prefix of any other Stratagem input, and, if there does exist such a pair of input codes, how many there are.

Input: The first line of input will consist of a single integer, $1 \leq n \leq 50$, denoting the number of testcases to follow. Each of the next n lines will consist of a comma-separated list of Stratagem inputs, which are denoted with the letters '`U`' for up, '`D`' for down, '`L`' for left, and '`R`' for right. It is guaranteed that the length of any given stratagem input will be between 1 and 10 characters in length, and that there will be between 1 and 100 stratagem inputs for any arbitrary request.

Output: For each of Jared's n requests, on their own line, if there are no Stratagem inputs which are a prefix of any other Stratagem inputs, output the string "`Democracy Prevails!`" If, however, there exists some set of invalid Stratagem inputs, output the string "`There are <#> misinputs...`" where <#> is the number of pairs of inputs in which one input is the prefix for the other input.

~ Jared continued… ~

Sample input:

```
4
LL,LR,U,UL,UU,D,RL,RD,RR
LL,LR,UL,UU,D,RL,RU,RD,RR
LLL,LLDR,LLDU,LLDD,LLD,LL,LUD,LU,LR,R
LLL,LLDR,LLDU,LLDD,LLD,LL,LUD,LU,LR,R,L
```

Sample output:

```
There are 2 misinputs...
Democracy Prevails!
There are 9 misinputs...
There are 18 misinputs...
```